

FOUR YEARS' CAPTURES OF INSECTS IN LIGHT TRAPS IN IRELAND.

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During the years 1936-39 I have regularly used a moth trap during the summer months for collecting specimens, particularly Microlepidoptera, but unfortunately, beyond noting the different species that came to the trap, no detailed records as to the number of specimens, weather conditions, etc., were kept.

The trap used was of the box type, four and a half feet square and open at the front, the insects entering through a vertical slit between the edges of three sheets of glass, two at one side and one at the other, extending vertically from floor to roof and inclined inwards and slightly overlapping, but not touching, in the mid line, leaving a space of an inch or so between their inside edges. The inside of the trap was painted white and illumination supplied by a 100-watt pearl electric bulb suspended in the middle near the back.

The primary disadvantage of this type of trap is, of course, that the illumination is given out, and the insects enter, at one side only and for this reason the type of trap described by Williams (*Trans. R. Ent. Soc. Lond.*, **83**: 523) and de Worms (*Entom.*, **63**: 226), in which the insects enter at all four sides, would probably be more efficient. The chief advantage of the large box type is that there is plenty of room inside for the insects to fly around and consequently less chance of their escaping, as nothing was used to kill or quieten them once they were inside the trap. I also used a smaller trap, two and a half feet square and illuminated by a 40-watt bulb, but this was much less efficient. In previous years I had experimented with different sizes and arrived at the conclusion that the larger the trap the greater its efficiency, not merely for attracting the insects, but for retaining them after their entry into the trap. Even in the large trap the proportion of escapes was probably high, perhaps 15-30% of the moths; or, at least, the larger and more active species, entering the trap, were not there in the morning, but in the smaller trap perhaps at least half, if not more, escaped. Naturally, the proportion of escapes was higher amongst the larger and more active Agrotidae than amongst the Microlepidoptera and probably few of the Tineina ever escaped. In the trap the moths tend to fly up and down the glass and for this reason there is probably less chance of their escaping from a trap with a vertical aperture than from one in which the entrance is horizontal.

The large trap was in use in my garden at Seapoint, Co. Dublin, during the summers of 1936-39 every night from about the middle of April to the end of October and in it were captured 310 species, or 28% of the total definitely recorded Irish Lepidoptera. The small trap was in use at Flesk, Killarney, Co. Kerry, for about ten days during August 1936 and 1937, and from the middle of June to the middle of July 1939. In this 41 additional species were taken, bringing the total up to 348, or 31.3%.

The Seapoint trap was elevated about five feet from the ground on four railway sleepers and faced north, over Dublin bay. It overlooked a garden, with fruit trees and various shrubs and plants, at the end of which there is a sloping grassy bank, about thirty feet high, followed

by a small area of waste ground bordered on the far side by a railway, on the other side of which there is a high wall separating it from the sea. On either side of the trap, about 15 yards away, was a house with a road in front, the garden being situated between the ends of two blind roads which were strongly lit with arc lamps until 0.30 a.m. every night. One of these lamps shone directly on the front of the trap from each side, with the result that they probably attracted the majority of insects before 0.30, and most of those entering the trap must have done so between that time and dawn. About 30 yards behind the trap was another house and behind, or rather in front of, this main road which was well lighted all night.

The situation was by no means favourable for Lepidoptera, as the nearest open country is at least two miles away behind the trap, the nearest woodland and heath over three miles to the south, and the nearest ponds or streams about two miles away in any direction; there are no sandhills on this, the south, side of the bay, but there are extensive areas about five miles away directly across the bay and extensive heaths and some woodland at Howth, also on the north side of the bay and about six miles away. I consider it probable that many of the heath and sandhill species came directly across the bay from Howth rather than up along the coast from Killiney or other locality.

The species of Lepidoptera captured during the four years were made up as follows, the figures in brackets representing the number of species, taken in the trap at Killarney, which were not taken at Seapoint:

	Spp. captured.	Total Irish spp.	% of total Irish spp.
Bombyces, etc.	20 (+3)	90	22 (+3)
Noctuidae (Agrotidae)	82 (+3)	220	37 (+1)
Geometridae	44 (+15)	204	24 (+8)
Pyralidae, etc.	42 (+8)	98	42 (+8)
Tortricina	51 (+2)	194	26 (+1)
Tineina	71 (+10)	300	24 (+3)
Total	310 (+41)	1106	28 (+3)

In addition, ten species of Trichoptera, all Limnophilidae, were taken at Seapoint and two more, both Leptoceridae, at Killarney. As stated above, the nearest breeding-ground for these insects is about two miles away from Seapoint.

The species of Lepidoptera may be divided into four groups: *i*. Rare: those of which not more than three specimens were taken over the period of four years, and in most cases only one or two specimens; *ii*. Occasional: those of which more than three specimens were taken but which did not occur every year; *iii*. Frequent: those which occurred every year but not in any numbers; *iv*. Common: those which occurred in considerable numbers every year. The following are the proportions taken in the Seapoint trap:

	Rare.	Occasional.	Frequent.	Common.
Bombyces, etc.	35%	20%	30%	15%
Noctuidae (Agrotidae)	28%	20%	33%	18%
Geometridae	25%	14%	41%	18%
Pyralidae, etc.	19%	26%	14%	41%
Tortricina	37%	18%	22%	24%
Tineina	24%	16%	28%	32%
Average	27%	19%	28%	25%

Over half (53%) of the species taken at Seapoint came in each of the four years, but only about 45% of the Bombyces and Tortrices were regular visitors, while about 60% of the Tineina and Geometridae were regular. The fact that the Geometridae in general fly early in the night probably accounts for the fact that only 24% of the total Irish species appeared, as compared with a general average of 28%. The low proportion of Bombyces (22%) was probably due to the general scarcity of most of the species in Ireland, and the low proportion of Tortrices and Tineina to their weaker powers of flight and more localised distribution, while the large proportion of Noctuids (37%) may be due to their strong powers of flight.

Many interesting species were captured, including a number new to the Irish list, all Microlepidoptera with the exception of *Plusia moneta*. A particularly interesting species is *Eumichtis lichenea*, which occurred in large numbers every autumn, as many as 147 in a single night—far commoner than any other species of Noctuid during September. There were only four previous Irish records for this species, odd specimens from three localities in Co. Dublin and a record from Rossbeigh, Co. Kerry. It apparently flies very late at night, perhaps just before dawn, and certainly later than 0.30. The Irish specimens are green and strongly marked and tend to be large in size.

The following is a list of the species captured, specimens marked "Killarney" were taken in the Killarney trap, but not at Seapoint, the remarks as to the abundance or otherwise of each species apply to Seapoint only:

Sphingidae. 1 sp.

Laothoe populi. Frequent.

Notodontidae. 5 spp.

Pheosia tremula. Rare.*P. gnoma (dictaeoides)*. Rare.*Notodonta ziczac*. Rare.*Lophopteryx capucina (camelina)*.
Rare.*Phalera bucephala*. Frequent.

Thyatiridae. 2 spp.

Habrosyne derasa (pyritoides). Rare.*Thyatira batis*. Rare.

Drepanidae. 1 sp.

Cilix glaucata. Frequent.

Nolidae. 1 sp.

Celama confusalis. Occasional.

Arctiidae. 9 spp.

Spilosoma lubricipeda (menthastri).
Common.*S. lutea (lubricipeda)*. Common.*Diacrisia sannio*. Killarney.*Arctia caia*. Occasional.*Callimorpha jacobaeae*. Occasional.*Nudaria mundana*. Frequent.*Lithosia quadra*. Rare.*Eilema lurideola*. Frequent.*E. deplana*. Killarney.

Noctuidae (Agrotidae). 85 spp.

Apantele (Acrionicta) psi. Frequent.*Cryphina (Bryophila) perla*. Com-
mon.*Agrotis segetum*. Frequent.*A. vestigiatis*. Occasional.*A. trux (lunigera)*. Rare.*A. exclamationis*. Common.*A. epsilon (suffusa)*. Frequent.*A. ripae*. Rare.*Euxoa nigricans*. Rare.*E. tritici*. Frequent.*Lycophotia varia (porphyrea)*. Fre-
quent.*Graphiphora augur*. Rare.*Amathes c-nigrum*. Frequent.*A. xanthographa*. Common.*A. sexstrigata (umbrosa)*. Frequent.*Diarsia brunnea*. Frequent.*D. festiva*. Frequent.*D. rubi*. Frequent.*Ochropleura plecta*. Rare.*Axytia putris*. Killarney.*Triphaena comes*. Frequent.*T. pronuba*. Common.*T. ianthina*. Frequent.*Mamestra brassicae*. Frequent.*Diataraxia oleracea*. Common.*Hadena nana*. Occasional.*H. cucubali (rivularis)*. Occasional.*H. bicurris (capsincola)*. Occasional.*H. lepida (carpophaga)*. Occasional.*Tholera popularis*. Occasional.*Cerapteryx graminis*. Frequent.*Eumichtis adusta*. Frequent.*E. lichenea*. Common.*Dryobates protea*. Rare.*Luperina testacea*. Common.*Apamea obscura (ravida)*. Occasional.

- A. sordens* (*basilinea*). Occasional.
A. secalis. Frequent.
A. ophiogramma. Rare.
A. crenata (*rurea*). Frequent.
A. lithoxylea. Occasional.
A. monoglypha. Common.
Procus strigilis. Occasional.
P. fasciuncula. Occasional.
Antitype chi. Occasional.
Meganephria oxyacanthae. Rare.
Euplexia lucipara. Rare.
Phlogophora meticulosa. Frequent.
Naenia typica. Frequent.
Hydroecia oclea (*nictitans*). Frequent.
H. micacea. Common.
Arenostola pygma (*fulva*). Rare.
Rhizedra lutosa. Rare.
Leucania pallens. Common.
L. impura. Common.
L. comma. Frequent.
L. lithargyria. Occasional.
L. conigera. Frequent.
Meristis trigrammica. Frequent.
Caradrina clavipalpis. Occasional.
Amphipyra pyramidea. Rare.
A. tragopoginis. Frequent.
Orthostia gothica. Common.
O. stabilis. Common.
O. advena (*opima*). Rare.
Cosmia trapezina. Rare.
Omphaloscelis lunosa. Common.
Agrochola circellaris. Rare.
A. lychnidis. Rare.
Citria lutea (*flavago*). Killarney.
Xylocampa areola. Occasional.
Cucullia umbratica. Occasional.
Pyrrhia umbra. Occasional.
Eustrotia uncula. Killarney.
Rivula sericealis. Frequent.
Scoliopteryx libatrix. Rare.
Polychrystia moneta. Rare.
Plusia chrysitis. Frequent.
P. bractea. Rare.
P. festucae. Rare.
P. pulchrina. Rare.
P. ni. Frequent.
P. gamma. Common.
Abrostola triplasia. Rare.
A. tripartita. Rare.
Hypeninae. 3 spp.
Zanclognatha tarsipennalis. Rare.
Z. grisealis. Rare.
Hypena proboscidalis. Occasional.
Geometridae. 59 spp.
Pseudopteryx pruinata. Killarney.
Hipparchus papilionaria. Killarney.
Hemithea aestivaria. Common.
Sterrhia aversata. Common.
S. biselata. Frequent.
Larentia clavaria (*cervinata*). Common.
Ortholitha mucronata (*plumbaria*). Killarney.
O. chenopodiata. Frequent.
Anaitis plagata. Rare.
Operophtera brumata. Frequent.
Ecliptopera silaceata. Killarney.
Lygris prunata. Rare.
L. testata. Killarney.
L. pyraliata. Occasional.
Cidaria fulvata. Rare.
Dysstroma truncata. Frequent.
Chloroclysta niata. Frequent.
Thera firmata. Killarney.
T. obeliscata. Killarney.
Xanthorhoë ferrugata. Frequent.
X. designata. Occasional.
X. montanata. Common.
X. fluctuata. Common.
Colostygia pectinataria. Killarney.
Epirrhoë alternata (*socia*). Frequent.
Euphyia unangulata. Killarney.
Lyconometra ocellata. Killarney.
Perizoma alchemillata. Rare.
P. albulata. Frequent.
P. bifaciata. Rare.
Euphyia bilineata. Rare.
Hydriomena coerulata (*impluviata*). Frequent.
Earophila badiata. Frequent.
Caenotephria derivata. Rare.
Eupithecia centaureata. Common.
E. pulchellata. Frequent.
E. absinthiata. Occasional.
E. vulgata. Occasional.
3 other *Eupithecia* spp. 1 frequent and 2 rare.
Chloroclystis rectangulata. Frequent.
Orthonama lignata. Killarney.
Abraxas grossulariata. Frequent.
Cabera pusaria. Killarney.
C. exanthemata. Killarney.
Anagoga pulveraria. Rare.
Campaea margaritata. Rare.
Deuteronomos ulniaria. Rare.
Selenia bilunaria. Common.
Gonodontis bidentata. Common.
Colotois pennaria. Occasional.
Crocotilis elinguaris. Frequent.
Ourapteryx sambucaria. Frequent.
Opisthograptis luteolata. Frequent.
Cleora rhomboidaria. Occasional.
C. lichenaria. Killarney.
Ectropis crepuscularia. Killarney.
Itame wauaria. Frequent.
Phycitidae. 7 spp.
Pempelia dilutella. Rare.
Satebria fusca. Rare.
Ephestia elutella. Occasional.
E. kuehniella. Occasional.
Homoeosoma binaevella. Killarney.
H. saxicola. Common.
Galleriadae. 2 spp.
Achroota (*Meliphora*) *grisella*. Occasional.
Aphomia sociella. Common.
Crambidae. 9 spp.
Crambus pascuellus. Common.
C. culmellus. Common.
C. pratellus. Common.
C. hortuellus. Common.

- C. perlellus*. Common.
C. inquinatellus. Killarney.
C. geniculeus. Common.
C. tristellus. Common.
C. selasellus. Rare.
- Pyraustidae. 21 spp.
Schoenobius mucronellus. Killarney.
Cataclysta stratiotata. Rare.
Hydrocampa nymphaeata. Killarney.
Notarcha ruralis. Frequent.
Eurhynpara hortulata (urticata). Frequent.
Phlyctaenia lutealis. Common.
P. ferrugalis. Common.
P. prunalis. Occasional.
P. fuscalis. Occasional.
P. sambucalis. Frequent.
Nomophila noctuella. Common.
Pyrausta purpuralis. Killarney.
P. cespitalis. Killarney.
P. olivalis. Frequent.
Scoparia angustea. Occasional.
S. resinea. Rare.
S. cembrae. Occasional.
S. dubitalis. Common.
S. ambiguus. Common.
Evergestis straminealis. Killarney.
Mesographe forficalis. Common.
- Pyralidae. 1 sp.
Pyralis farinalis. Rare.
- Alucitidae. 7 spp.
Platyptilia gonodactyla. Frequent.
P. pallidactyla. Occasional.
Alucita pentadactyla. Occasional.
Pterophorus monodactylus. Common.
Stenoptilia bipunctidactyla. Common.
- S. saxifragae*. Common.
S. pterodactyla. Frequent.
- Phaloniadae. 5 spp.
Phalonia enicana. Rare.
P. atricapitana. Common.
Euranthis straminea. Frequent.
E. zoequna. Common.
E. hamana. Common.
- Tortricidae. 19 spp.
Cacoecia oporana (podana). Occasional.
C. rosana. Rare.
Pandemis ribeana. Common.
Tortrix paleana. Common.
T. riburniana. Rare.
T. forsterana. Occasional.
T. costana. Rare.
T. unifasciana. Frequent.
Cnephasia chrysantheana. Occasional.
C. conspersana. Frequent.
C. incertana. Common.
Argyrotoza bergmanniana. Frequent.
A. conwayana. Occasional.
Peronea holmiana. Frequent.
P. contaminana. Rare.
P. latifasciana (schalleriana). Common.
P. variegana. Common.
- P. hastiana*. Rare.
P. sparsana (sponsana). Rare.
- Eucosmidae. 29 spp.
Spilonota ocellana. Common.
Acroclita naevana. Occasional.
Ancylis lundana. Frequent.
Notocelia uddmanniana. Occasional.
N. rosaecolana. Killarney.
N. suffusana (trimaculana). Rare.
N. aquana (roborana). Frequent.
Eucosma trimaculana. Rare.
E. cana. Common.
E. hohenwarthiana (scopolianna). Rare.
E. tripunctana. Common.
E. solandriana. Rare.
E. semifuscana. Rare.
Bactra lanceolana. Occasional.
Polychrosis dubitana (littoralis). Common.
Endothenia ericetana. Occasional.
E. antiquana. Occasional.
Argyroploce nubiferana (variegana). Frequent.
A. pruniana. Frequent.
A. striana. Rare.
A. lacunana. Frequent.
A. decrepitana (bifasciana). Rare.
Pammene fasciana (juliana). Killarney.
Pammene regiana. Rare.
Laspeyresia formosana (woeberiana). Rare.
L. pomonella. Rare.
L. succedana (ulicetana). Rare.
- Gelechiidae. 16 spp.
Telphusa fugitivella. Rare.
T. vulgella. Rare.
Bryotropha domestica. Common.
B. terrella. Common.
Gelechia diffinis. Occasional.
G. mulinella. Occasional.
Phthorimaea plantagnella. Rare.
P. obsoleteella. Occasional.
P. instabilella. Rare.
P. costella. Common.
P. leucomelanella. Rare.
Stomopteryx anthyllidella. Frequent.
S. sangiella. Frequent.
Acompsia cinerella. Killarney.
Anarsia spartiella. Frequent.
Brachmia rufescens. Rare.
- Cosmopterygidae. 2 spp.
Blastodacna atra (vinolentella). Common.
Batrachedra praeangusta. Occasional.
- Blastobastidae. 1 sp.
Blastobasis lignea. Common.
- Oecophoridae. 12 spp.
Endrosis lactella. Common.
Borkhausenia fuscescens. Common.
B. pseudospirella. Common.
Carcina quercana. Frequent.
Depressaria heracliata. Occasional.

- D. badiella*. Occasional.
D. costosa. Frequent.
D. umbellana. Rare.
D. liturella. Rare.
D. assimilella. Killarney.
D. propinquella. Occasional.
D. yeatiana. Rare.
 Orneodidae. 1 sp.
Orneodes hexadactyla. Rare.
 Elachistidae. 6 spp.
Elachista cinereopunctella. Killarney.
E. atricomella. Common.
E. kilmunella. Rare.
E. obscurella. Killarney.
E. rhynchosporella. Rare.
E. cygnipennella. Common.
 Hyponomeutidae. 6 spp.
Argyresthia semitestacella. Killarney.
Swammerdammia lutarea. Common.
S. pyrella. Frequent.
Prays curtisellus. Frequent.
Hyponomeuta padella. Frequent.
H. cognatella. Frequent.
 Eupistidae (Coleophoridae). 8 spp.
Eupista (Coleophora) spissicornis. Frequent.
E. deauratella. Frequent.
E. frischella. Frequent.
E. pyrrhulipennella. Rare.
E. discordella. Frequent.
E. annulatella. Common.
E. apicella. Rare.
E. glaucicolella. Occasional.
 Gracilariidae. 13 spp.
Lithocolletis messaniella. Common.
L. mespiliella (pyrivorella). Common.
Acrocerops brongniardella. Frequent.
Ornix guttea. Rare.
O. anglicella. Common.
O. scoticella. Common.
O. betulae. Killarney.
Gracilaria phasianipennella. Killarney.
G. syringella. Occasional.
G. tringipennella. Common.
G. elongella. Rare.
G. alchimiella. Rare.
G. stigmatella. Killarney.
 Epermeniadae. 1 sp.
Epermentia chaerophyllella. Frequent.
 Plutellidae. 4 spp.
Cerostoma xylostella. Common.
C. vittella. Frequent.
Plutella porrectella. Occasional.
P. maculipennis. Common.
 Lyonetiidae. 4 spp.
Opostega salaciella. Killarney.
Leucoptera laburnella. Frequent.
Lyonetia clerckella. Occasional.
Tischeria marginata. Frequent.
 Tineidae. 6 spp.
Monopis rusticella. Frequent.
M. ferruginella. Common.
Tinea cloacella. Common.
T. insectella (misella). Killarney.
T. lapella. Frequent.
T. semifulvella. Common.
 Hepialidae. 4 spp.
Hepialus humuli. Frequent.
H. fusconebulosus. Occasional.
H. lupulinus. Frequent.
H. hectus. Killarney.

TRICHOPTERA.

- Limnophilidae. 10 spp.
Glyphotaelius pellucidus.
Limnophilus lunatus.
L. vittatus.
L. auricula.
L. hirsutus.
L. luridus.
L. sparsus.
Stenophylax permixta.
Micropterna sequax.
Halesus digitatus.
 Leptoceridae. 2 spp.
Leptocerus albifrons. Killarney.
Mystacides azurea. Killarney.

" THE PTINIDAE OF ECONOMIC IMPORTANCE. "

(By H. E. HINTON.)

Bull. Ent. Research, 31, 331-81, 59 text figs. (1941).

This paper appears to us to be well written; the key to the species mentioned seems to be sound; the descriptions good; and the figures and dissections of the genitalia excellent.

This review must, of necessity, be imperfect, for we do not profess to possess the knowledge required to criticise the morphological part of the paper. To do this properly a study of the Ptinidae would require to have been made, extending over a period of many years. We are